JUN 22 1903

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THE INLAND ARCHITECT AND NEWS RECORD

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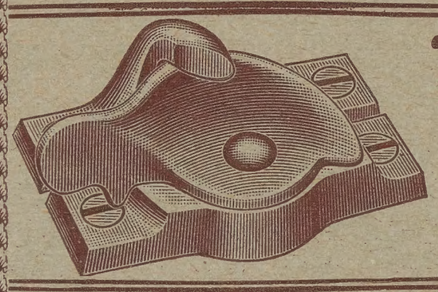

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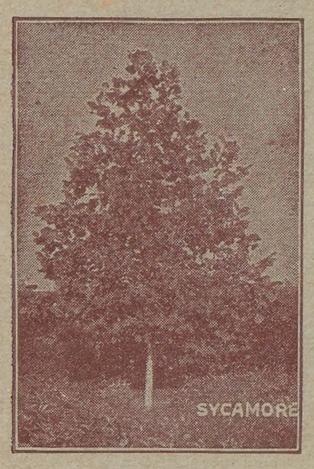

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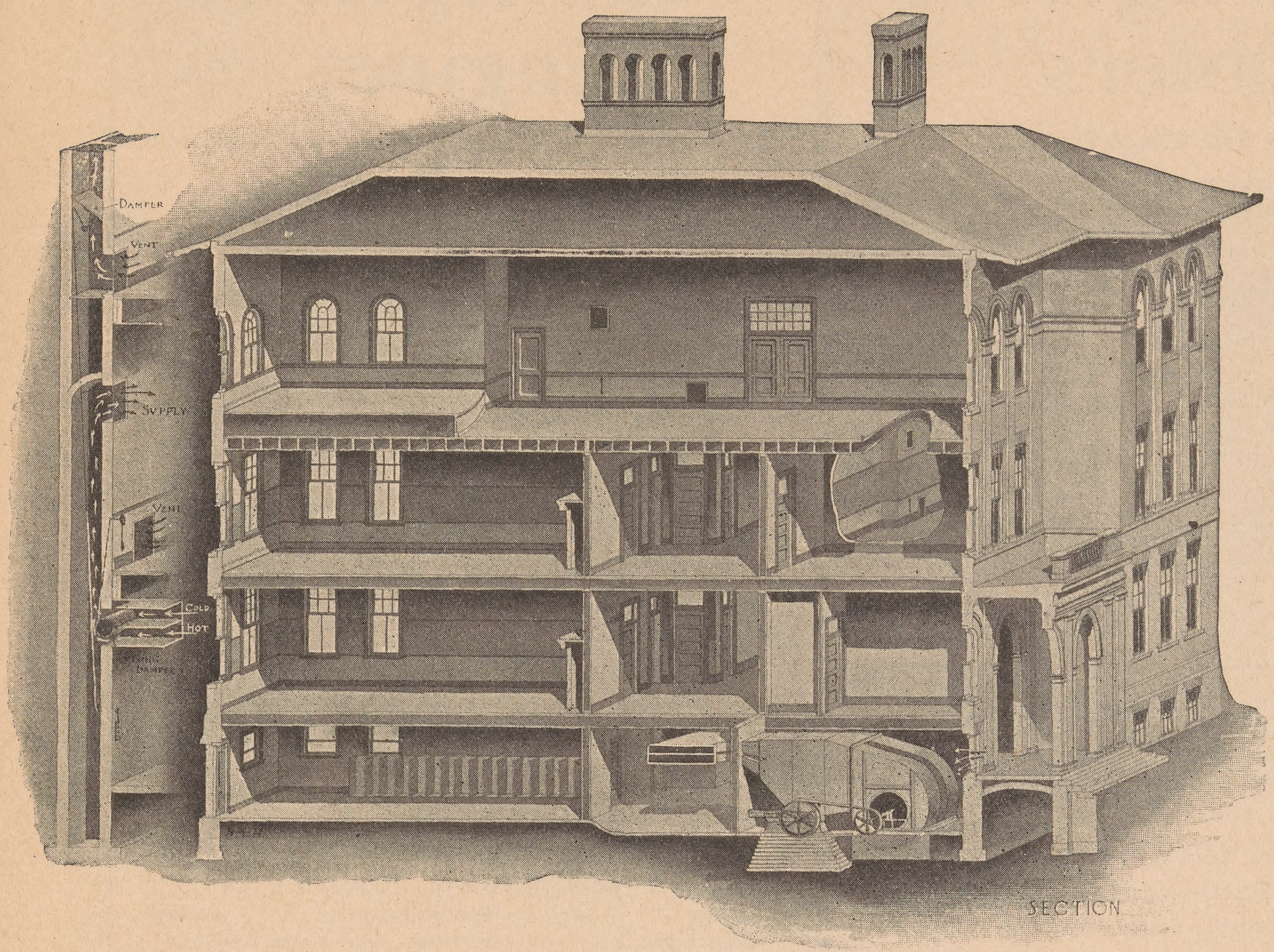

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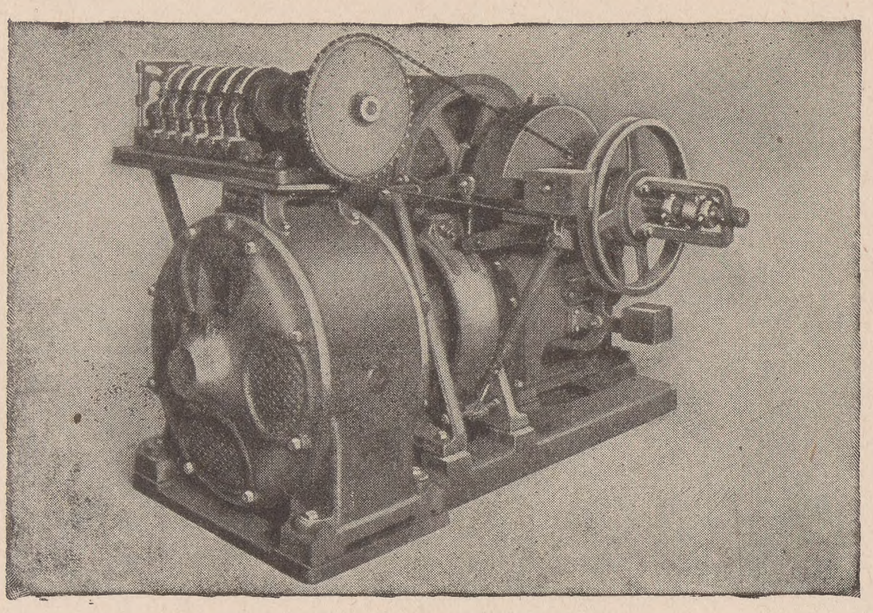

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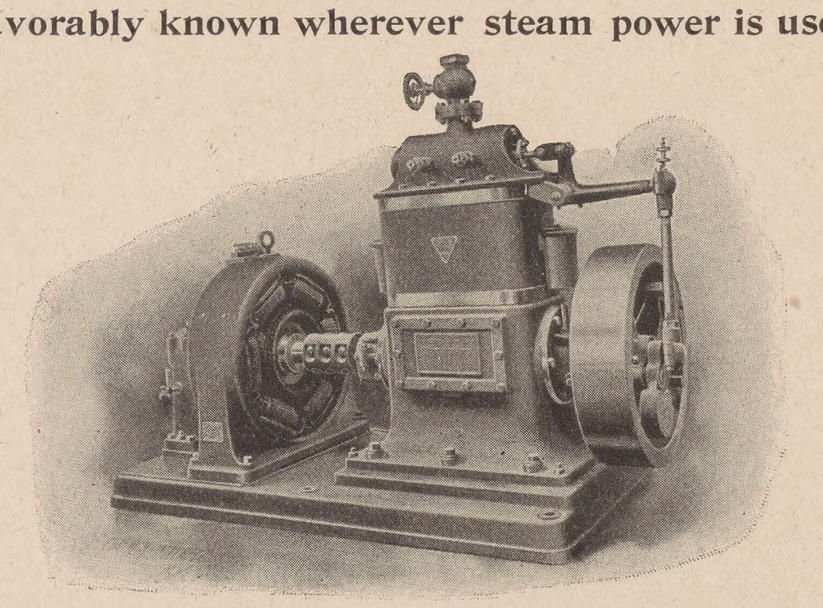

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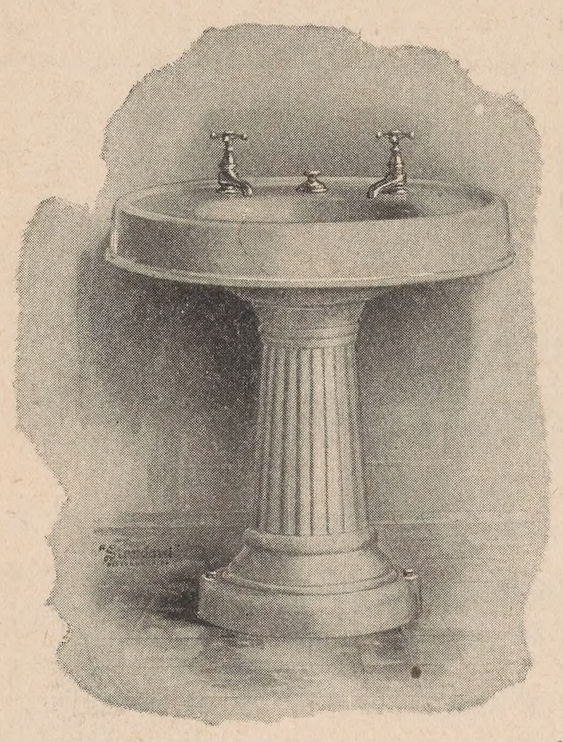

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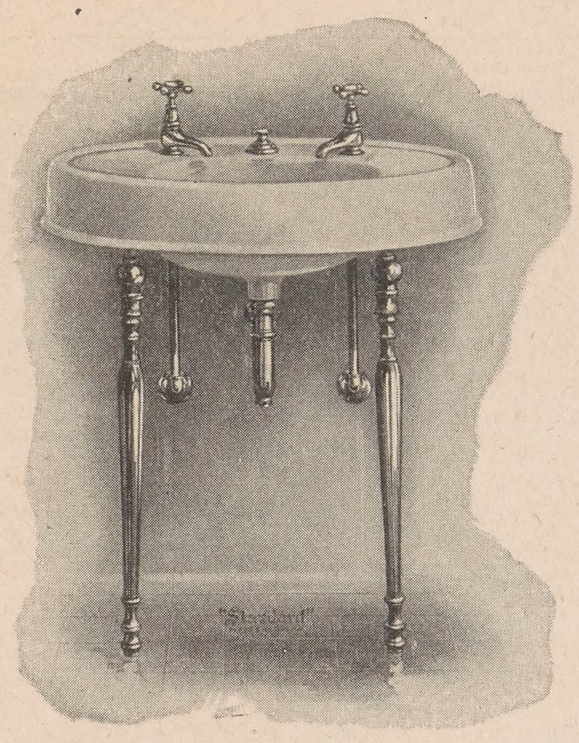

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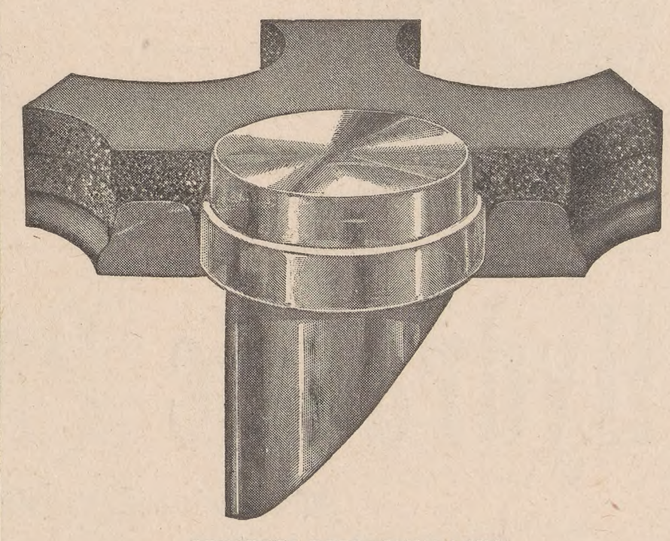

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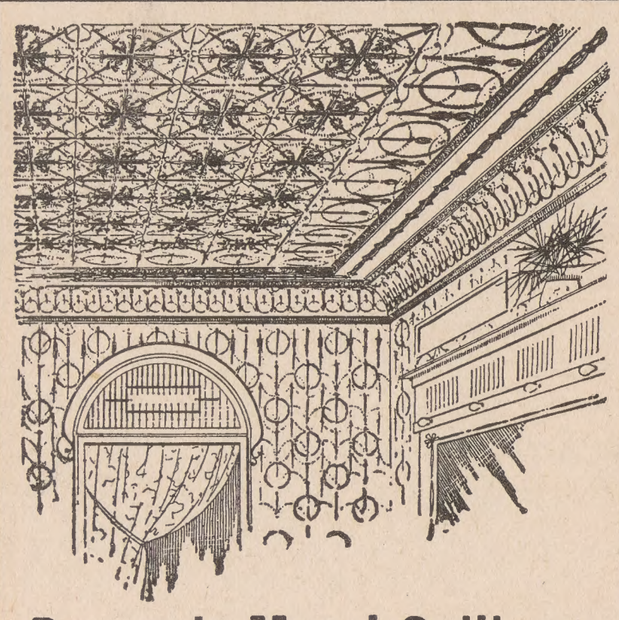

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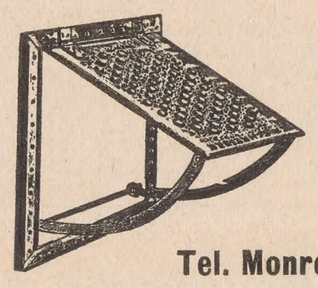

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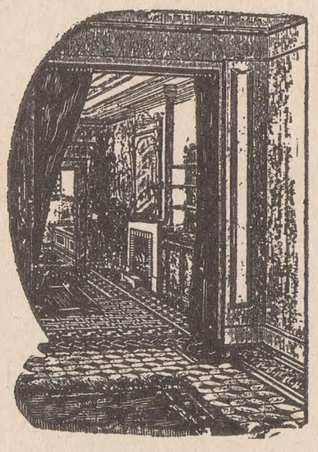

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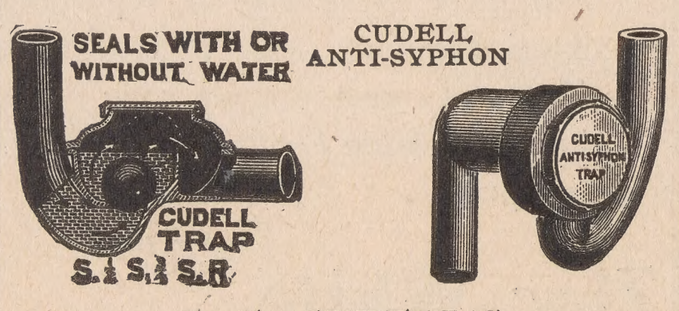

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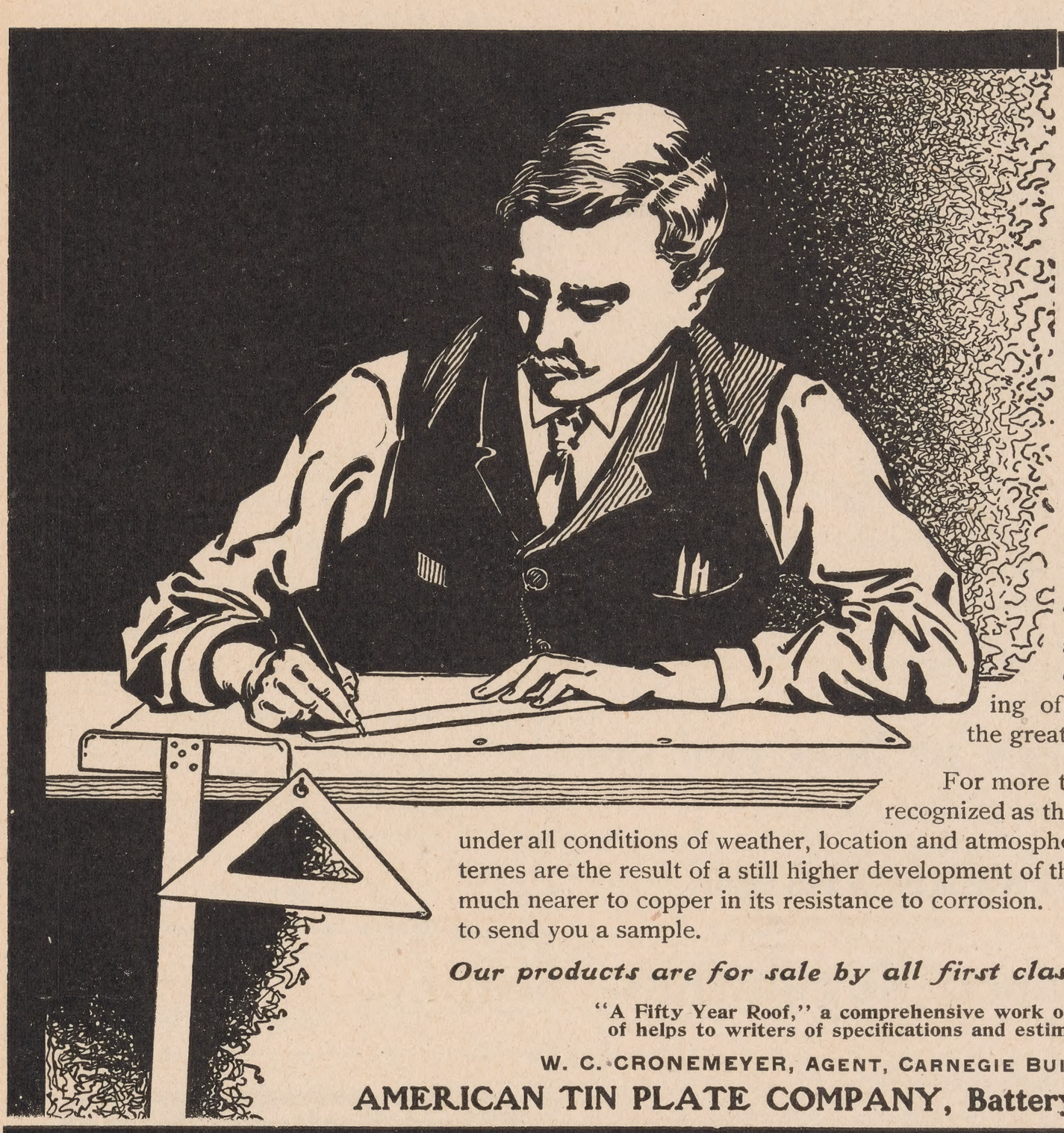

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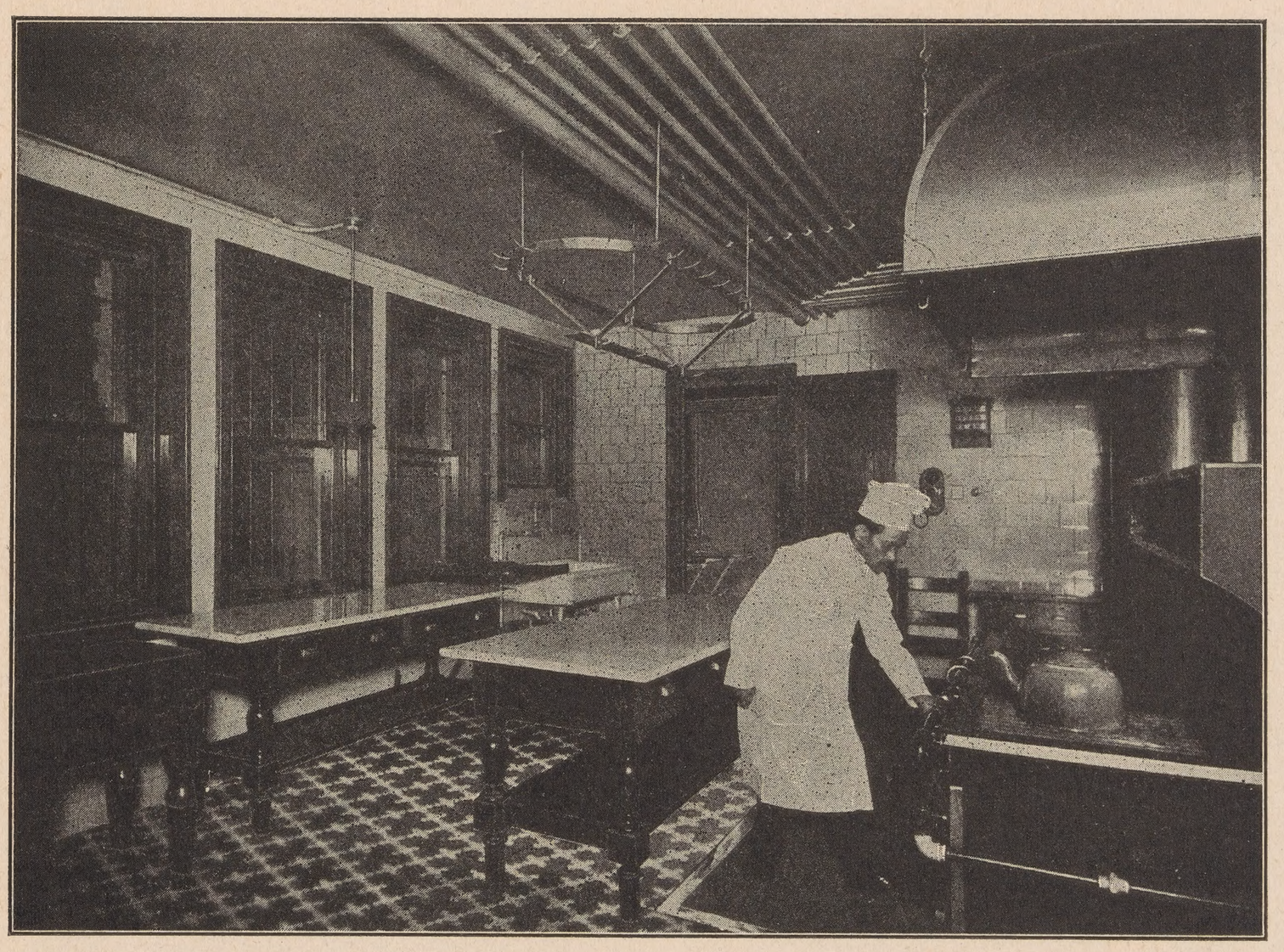

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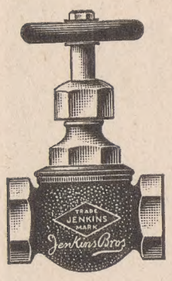

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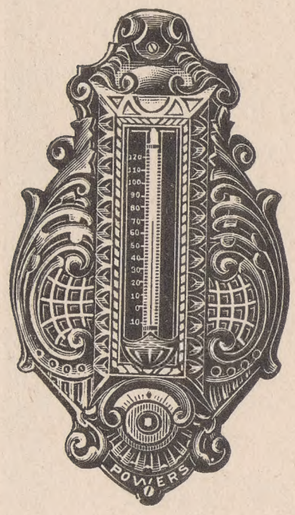

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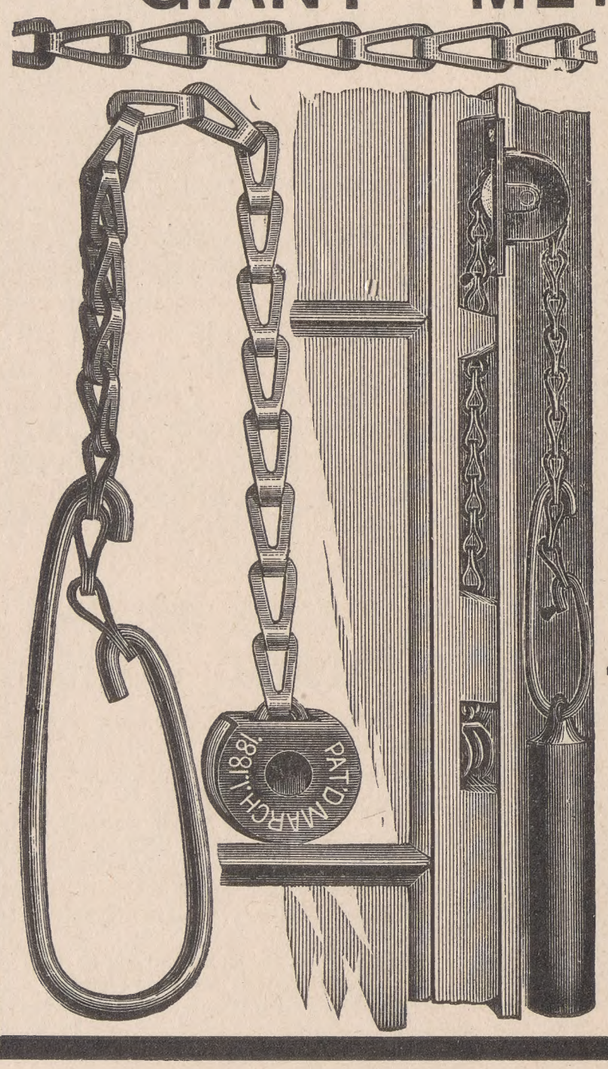

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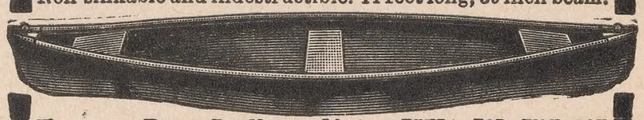

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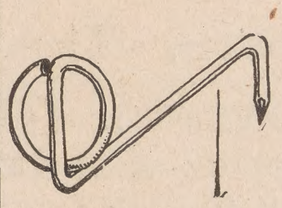

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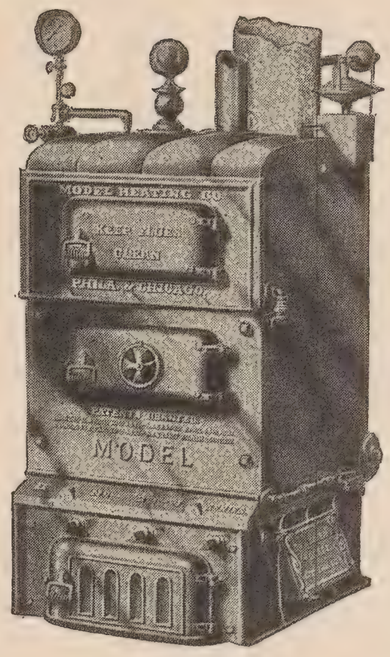

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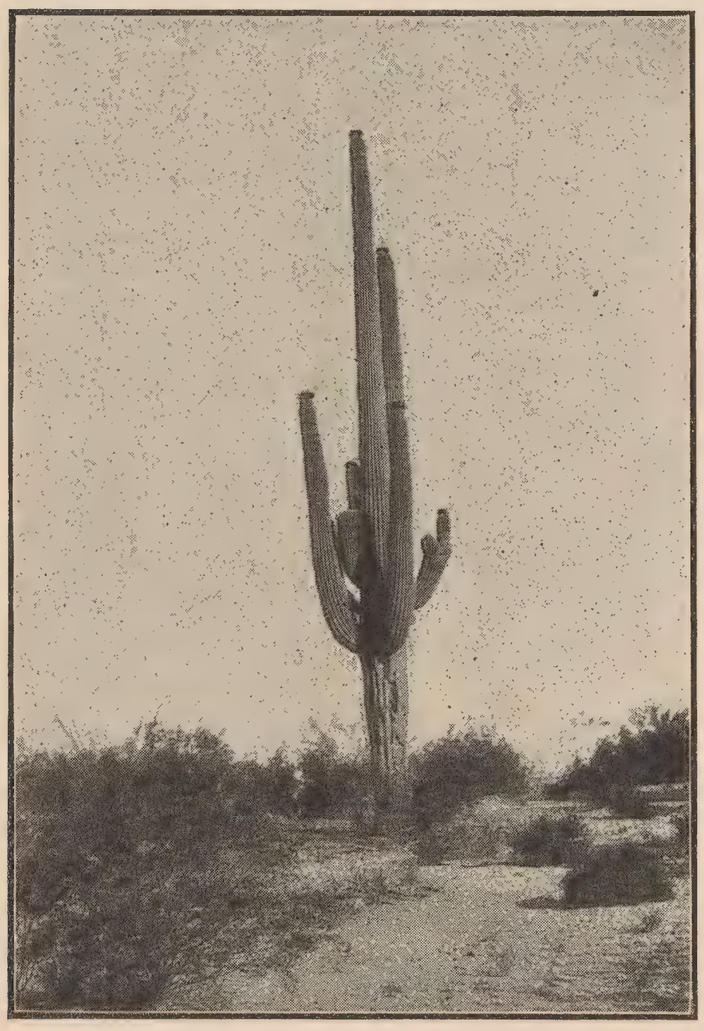

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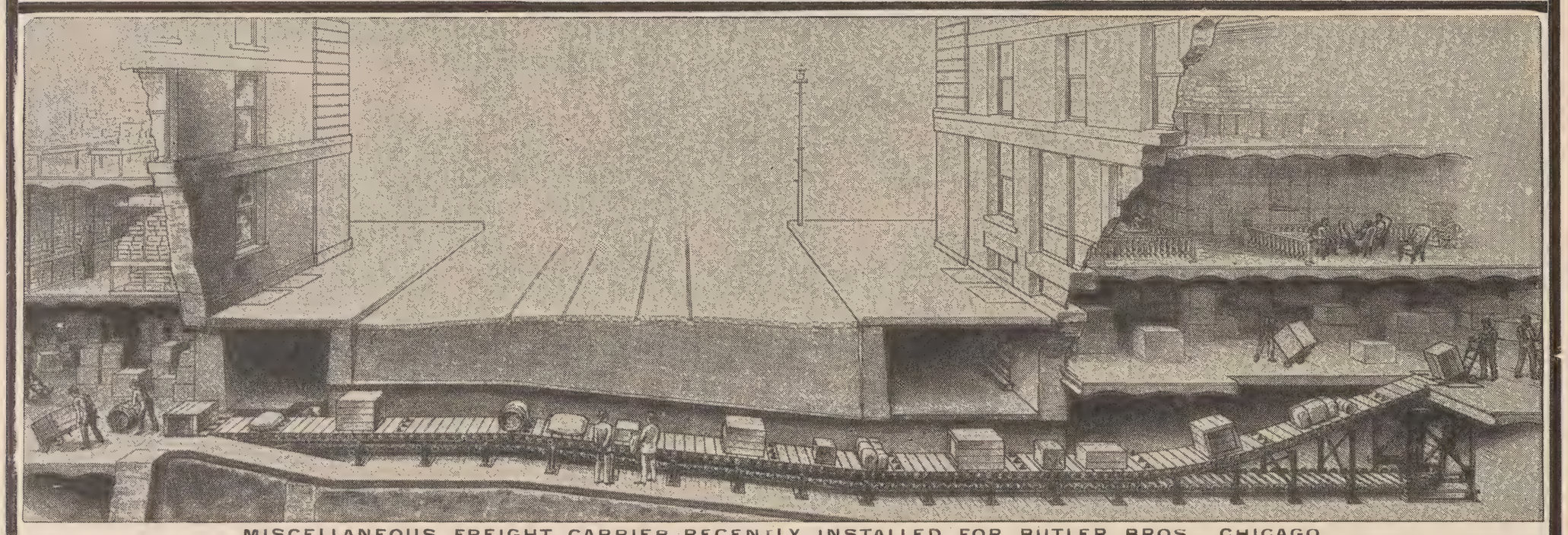

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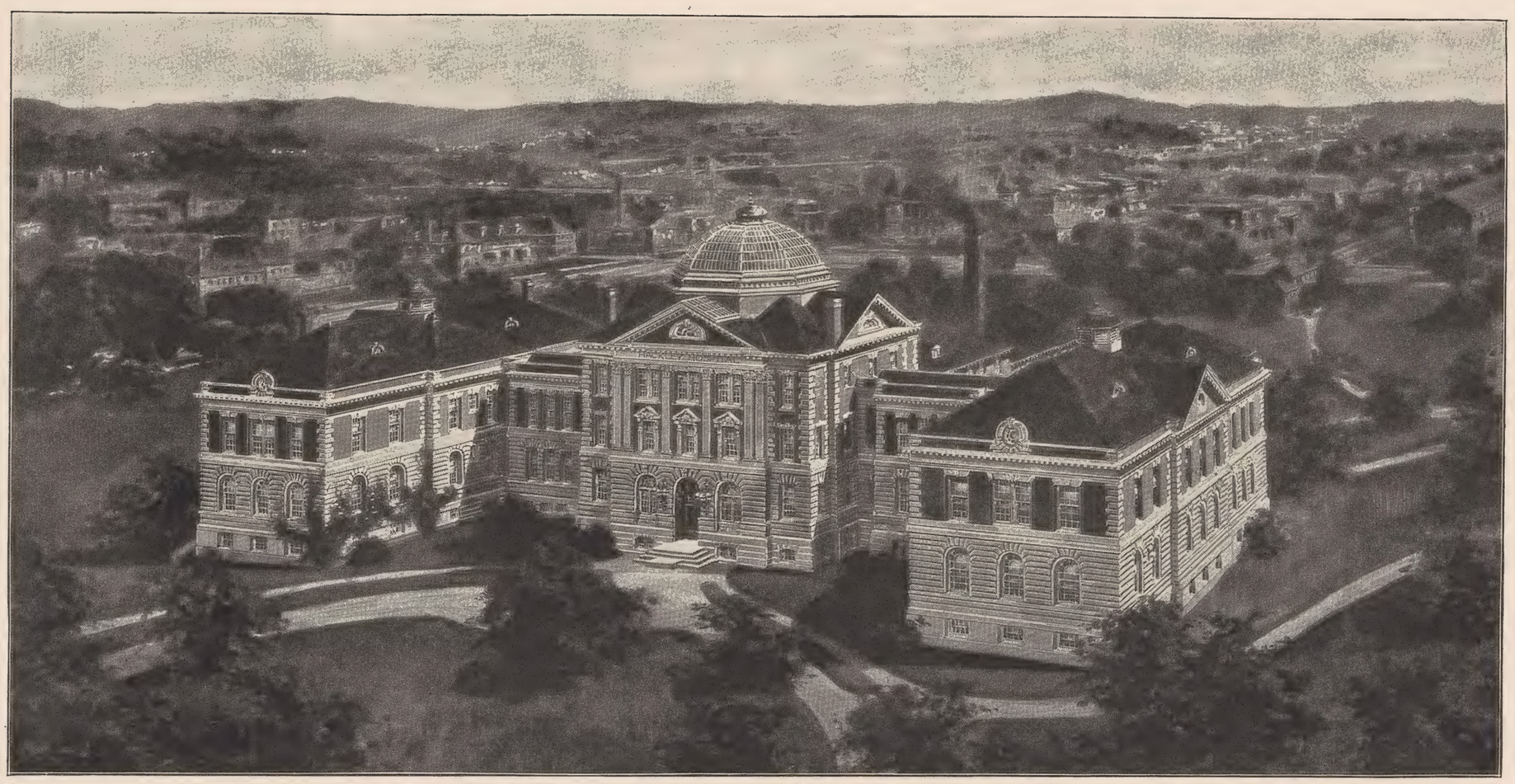

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THE INLAND ARCHITECT AND NEWS RECORD

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IN THE WEST.

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Death of Bruce Price, Architect.

The greatest loss the profession has sustained in some particulars since that of Root is the death of Bruce Price, of New York, at Paris on May 29. He was born in Cumberland, Maryland, December 12, 1845, his father being William Price, a distinguished lawyer, and his mother, a descendant of the Bruce family of Scotland. He early displayed evidence of artistic tendencies, and instead of going to college became the sole student of Nierensee & Neilson, the Baltimore architects. With this firm he remained four years; then he spent nearly a year abroad and upon his return associated himself with George Baldwin, of Baltimore. In 1873 he went to Wilkesbarre, Pennsylvania, where he practiced his profession four years. Coming to New York in 1877, Mr. Price soon made an impression with his genius and originality, and his name has been closely identified with the architectural history of New York in the last twenty-five years, and his genius is perpetuated in many of the most magnificent show places, both for residential and decorative purposes, in the country. When Pierre Lorillard began the development of Tuxedo Park, he called upon Bruce Price, and it was largely under his direction that the beauties of the place were brought out. George Gould, also seeking the best advice as to the enhancement of the beauties of Lakewood, sought the assistance of Mr. Price, and Georgian Court, in all its perfection of beauty, wealth of adornment and development of detail, is the conception of Bruce Price. Canada paid tribute to him, and many of the most important buildings of the Canadian Pacific Railway were after plans prepared by him. Notable among these is the Windsor street station, in Montreal, and the hotel at Banff Park, erected at the point where the Canadian Pacific Railway crosses the Rocky Mountains. The Chateau Frontenac, in Quebec; the Royal Victoria College, Montreal, presented by Sir Donald Smith; the East End station and Hotel Place Vigor, Montreal, were designed by him. In New York city many imposing and beautiful structures were built from his plans. Notable among these are the American Surety Building, the St. James Building, the International Bank Building, and the Century Building. He designed the Hunt Memorial, which decorates the west side of Fifth avenue at a point near the Metropolitan Museum of Art, and the several memorial buildings at Yale were planned by him. The architects of New York and the country elected him president of the Architectural Society of America in 1897. He frequently wrote and spoke on architectural subjects. Several months ago Mr. Price and Mr. de Sibour formed a partnership, and the business will be carried on by Mr. de Sibour. A comparatively young man, at the zenith of his architectural practice, his name always considered when any great architectural work was contemplated, his loss is definite and irreparable. He is survived by his widow, a daughter, Mrs. Edwin M. Post, wife of a New York banker; two maiden sisters, Miss Elizabeth Price, who lives at New Brighton, and Miss Harriet A. Price, whose home is at Colorado Springs, and a brother, Benjamin Price, who with his wife lives at No. 12 West Tenth street, New York.

PIPING FOR STEAM HEATING.

BY C. E. THOMAS, ARCHITECT.

MOST steam-heating systems are designed for low-pressure steam and the pipes are arranged so that the water of condensation will flow back to the boiler of its own weight, hence are called gravity systems. When the boiler furnishes power also, the engine will require a higher pressure than is desirable for the heating system and a reducing valve is placed on the heating main. Owing to the difference in pressure, the water can not enter the boiler by gravity but must be returned by a pump, injector or other similar apparatus; otherwise the system would be practically a gravity system.

The following rules cover the principal points in laying out a piping system:

1. *All pipes should be graded to drain readily, and, if possible, the steam and water should flow in the same direction.*

2. *The alignment of all pipes should be preserved.* This is necessary as a depression will cause a water pocket and an elevation produces an air lock, either of which would be disastrous to the system. It is often necessary to raise a pipe line at a certain point, for instance, to clear a door, and this may be accomplished by draining the low point of the line by a small relief pipe which connects with the return below the water level.

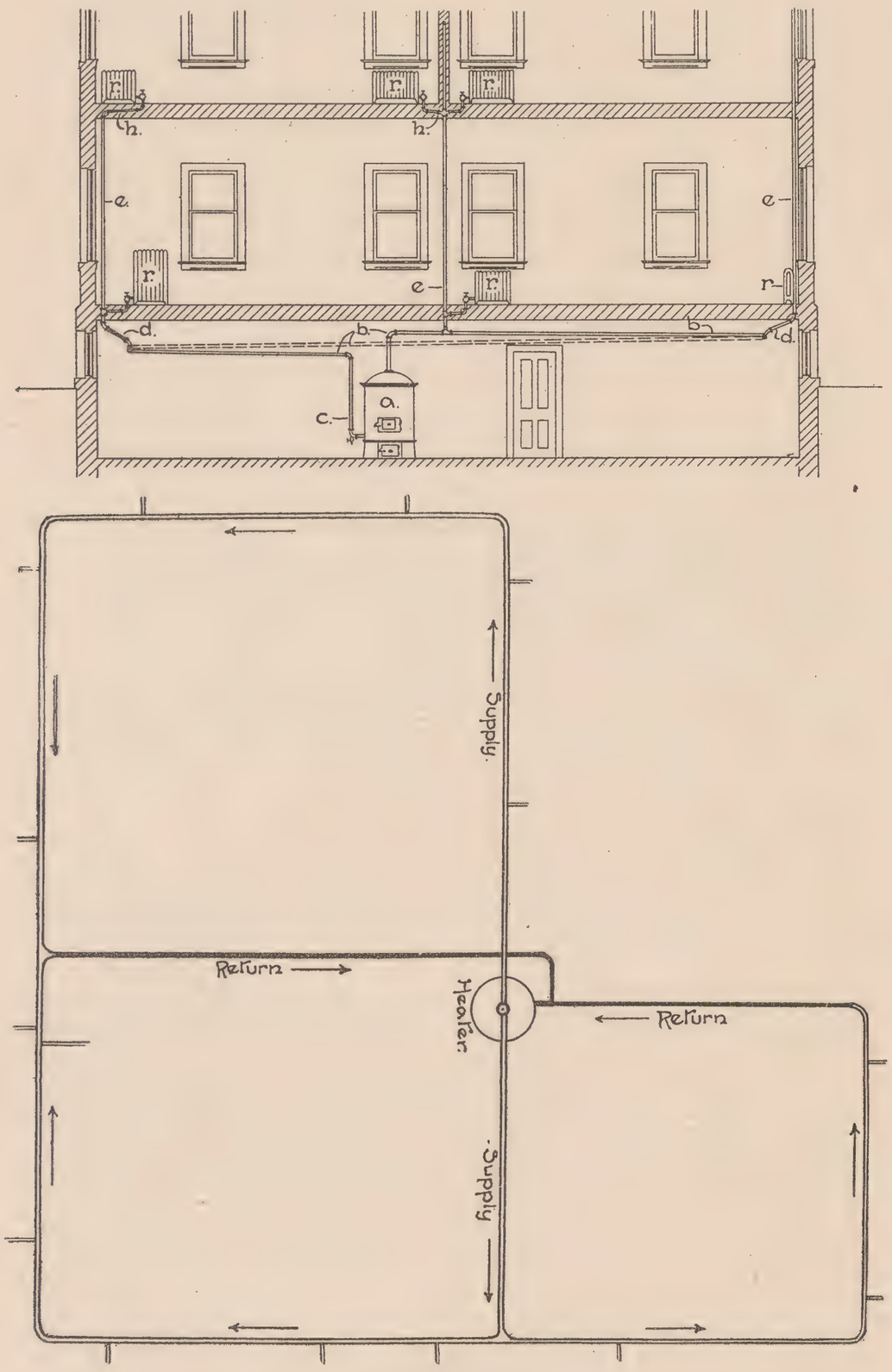


DIAGRAM NO. 4.

3. *Ample provision must be made for the expansion and contraction of the pipes.* This amounts to about 1.4 inches in one hundred feet and will generally be taken care of by bends in the pipe lines.

4. *The lowest radiators should be 3 feet 6 inches above the level of the water in the boiler.* This height allows for a difference in pressure of about 1½ pounds and is often reduced, but should never be less than 2 feet if the water is to be returned to the boiler by gravity.

SYSTEMS OF PIPING.

There are two classes of piping systems, namely, the two-pipe and the one-pipe. These are combined and varied in a great many ways. The two-pipe systems consist essentially of two sets of pipes, one from the boiler to the radiator, through which the steam is supplied, and the other from the radiator to the boiler by which the water is returned. In the one-pipe systems the steam and the water flow in the same pipes.

The two-pipe system affords a positive circulation, as it has a complete circuit through each radiator. The one-pipe system, while not being as positive, has proven very satisfactory, and on account of its simplicity and greater economy is widely used. It is an open question as to whether or not one connection to direct radiators is not as good as two, even in a two-pipe system.

In a two-pipe system the main is usually suspended from the ceiling of the basement with the return hung just beneath it until within a few feet of the boiler where it drops to connect with the boiler below the water level, or the return may be placed below the basement floor. In the latter case the pipe will be full of water and is termed a wet return, while the former is called a dry return.

In Fig. 4 is shown what is known as a one-pipe circuit system. From the top of the boiler *a* is taken the main *b* which forms a circuit around the basement and returns to the boiler at *c*. The main is highest immediately over the boiler, and from this point has a pitch downward of 1 inch in 10 feet. It is placed about two feet from the walls so that a short branch *d* is necessary to connect it with the risers *e*, which supply the radiators *r*. This branch allows the mains to expand without injuring the risers, and a similar connection with the radiators as at *h* permits the risers to expand without lifting the radiators. The drop *c* is made so that the return will be below the water level and that the colder water may enter at the bottom of the boiler. At the bottom of this drop a blow-off cock is placed so that the system may be drained.

In operation, the steam flows from the boiler through the main and risers to the radiators where it is condensed and the water passes down the risers to the main, through which it flows back to the boiler. It will be noticed that the steam and water flow in the same direction in the main, but in opposite directions in the branches and risers. No difficulty arises from the latter however, as the velocity of the water is increased by falling and the velocity of the steam by rising.

In large plants it is generally better and cheaper to run two or more small circuits, as shown in Fig. 5, than one large circuit.

SIZES OF MAINS.

The heating capacities of various kinds of radiation, as given by different writers, are nearly uniform, but the capacities given for pipes differ widely. The resistance, steam pressure and kind of radiation must all be considered in the calculations for pipe sizes.

RESISTANCE.

The resistance is mostly due to friction between the steam and pipe, and varies with the ratio of the circumference to the area, hence is much greater in a small pipe than a large one. For example, this ratio would be 4 to 1 for a 1-inch pipe and .5 to 1 for an 8-inch pipe. The resistance also varies with the square root of the length and the square of the velocity, hence the longer the pipe or the greater the velocity, the greater will be the resistance. The resistance of bends and fittings is much greater than that of straight pipe and must be considered. To simplify calculation these are reduced to their equivalents in straight pipe and added to the pipe to give the *equivalent length of pipe.*

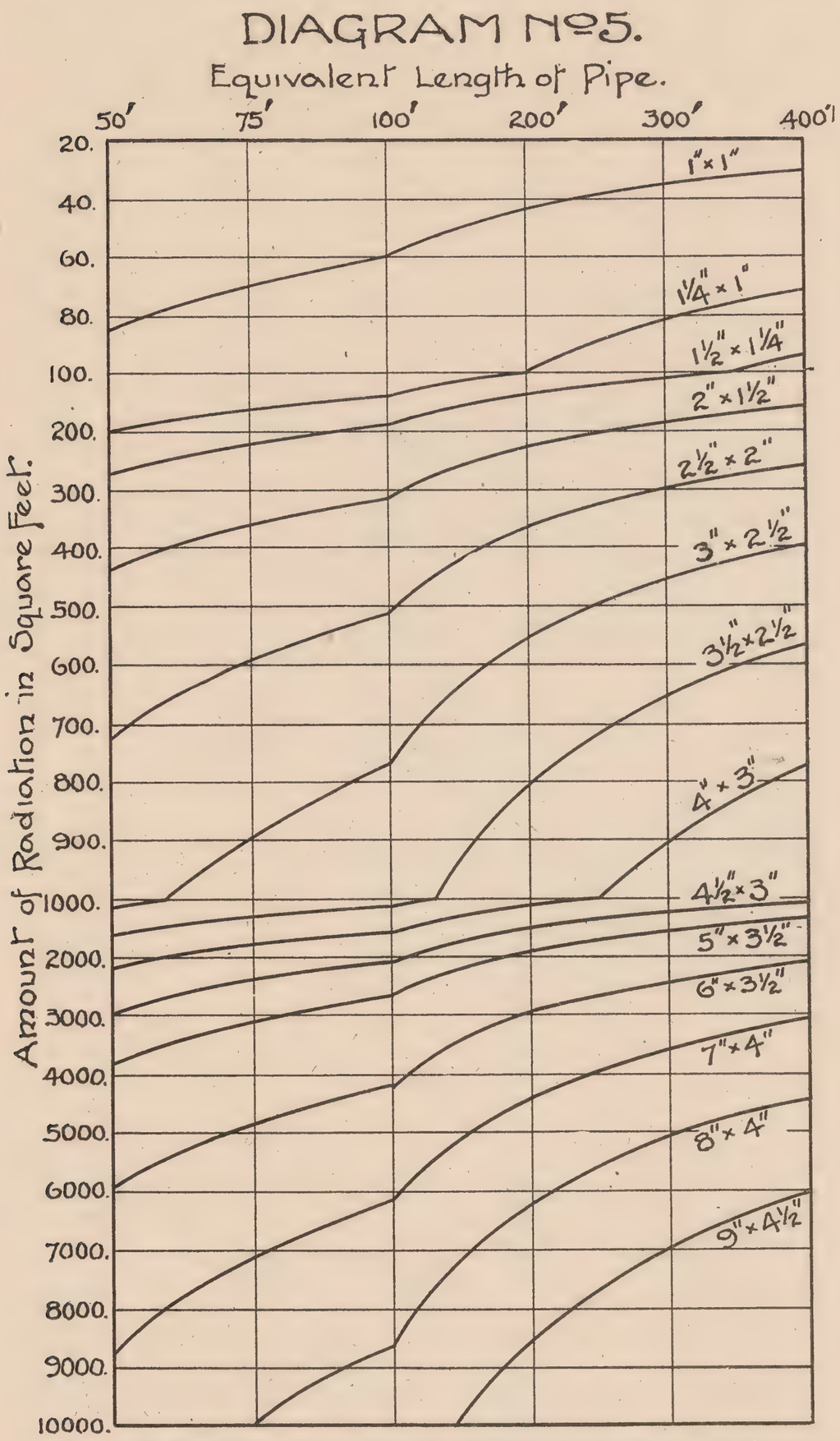
For ¼ bends add 40 diameters, for globe valves add 125 diameters, and for an end tee add 60 diameters.

PRESSURE.

The circulation in a steam system is caused by the difference in weight of the ascending column of steam and the descending column of water and air, and the theoretical velocity might be obtained from a formula similar to that for falling bodies. As this difference in weight is considerable the velocity of steam is great, but to overcome the friction of pipes and fittings requires a loss of velocity which is the same as a loss in pressure. Thus, with high-pressure steam flowing at the rate of 100 feet per second, the loss in pressure at the end of a 100-foot pipe would be about one pound. Such a loss of pressure would be admissible in a high-pressure system, as the water line need not be considered, but with a gravity system the pressure of the boiler would raise the water in the returns until the pressure was equalized. For each pound of difference in pressure the water will

rise about 2.4 feet, and any radiators less than that height above the water level would become choked.

On account of this loss in pressure, it is best to assume a low velocity which will cover all general conditions; the diagrams 5 and 6 are based on a velocity of 25 feet per second for a 1-inch pipe and 50 feet per second for an 8-inch pipe.



The intersection of the horizontal and the vertical corresponding to the amount of radiation and the length of pipe, respectively, locates the diagonal giving the sizes of pipes required.

TWO-PIPE STEAM SYSTEM.

The method of calculating the size of pipe for 500 square feet of direct radiation with a steam velocity of 30 feet per second is given in the following:

As one square foot of direct radiation requires 270 B. T. U. per hour, 500 square feet would require 135,000 B. T. U. As one pounds of steam throws off 965 B. T. U. in condensing, it would require $\frac{135,000}{965} = 140$ pounds per hour, which would be equal to 140 times 26 cubic feet or 3,440 cubic feet of steam per hour. A velocity of 30 feet per second is equal to 108,000 feet per hour; hence the area of the required pipe would be $\frac{3,440}{108,000} = .0318$ square feet, or 4.56 square inches, which is about the area of a 2½-inch pipe.

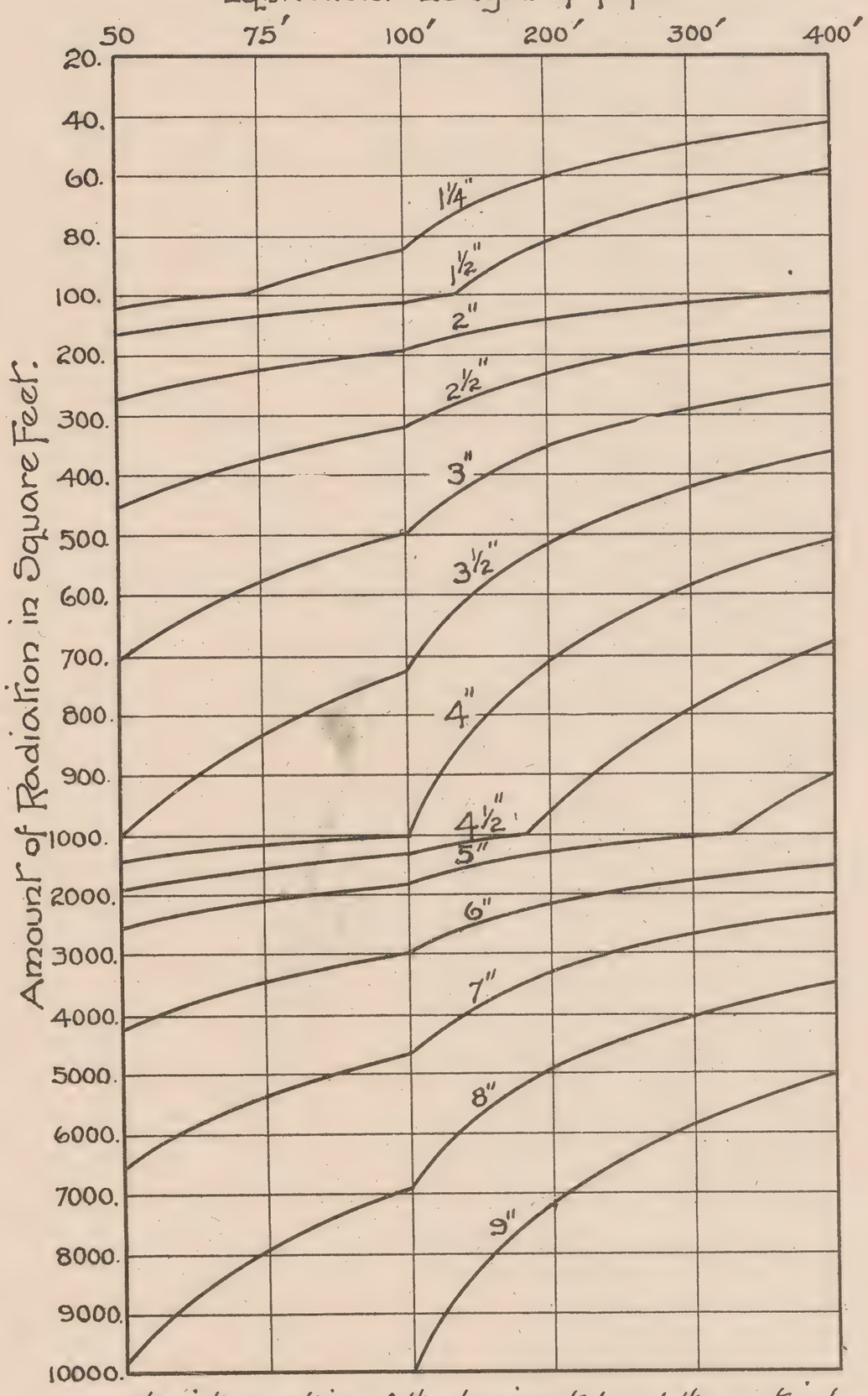
RETURN PIPES.

As the velocity of the return is much less than that of the supply, and varies greatly under different conditions, no rule for proportioning these pipes for their relative volumes can be used. The sizes of returns given in diagram No. 5 are those which have proven satisfactory in practice.

SINGLE PIPES.

The area of a pipe carrying both steam and water should be equal to the sum of the areas of the proper supply and return for that amount of steam. The increase in size of pipe reduces the pipe friction, but this is offset by the friction of the steam and water flowing in opposite directions.

It is not economy to reduce the size of mains as the different branches are taken off and in all small circuits it is best to continue the pipe around full size, as shown in Fig. 4. In the one-pipe circuit system, as shown in Fig. 4, it will be noticed that the branches are not taken from one point only, but are scattered along its entire length, hence the load on it is constantly being reduced, also that the steam flowing in the same direction as the water will increase the velocity of the latter. For these reasons it will be safe to use the size of main given for a two-pipe system for the required amount of radiation and a length of pipe equal



The intersection of the horizontal and the vertical corresponding to the amount of radiation and the length of pipe, respectively, locates the diagonal giving the size of pipe required.

ONE-PIPE STEAM SYSTEM.

to the equivalent length of circuit. Where two circuits join one return, as in Fig. 5, the return is proportioned for the sizes of the supplies.

KINDS OF RADIATION.

The amount of steam required varies for different kinds of radiation, and as the capacities of pipes and heaters are given in direct radiation, it becomes necessary to reduce all radiation to this unit. It is usual to add twenty-five per cent for direct-indirect and fifty per cent for indirect. The latter is safe for

residence work or where the hot-air stack is not more than 6 feet high, but for other conditions the sizes of pipes should be calculated for the amount of steam required for different velocities of air, as given in diagram No. 3. Indirect radiation should always be placed on a two-pipe system and for this reason many plants are installed with a one-pipe system to the direct radiation and a two-pipe system to the indirect and the direct-indirect.

As the amount of heat given off by the mains and branches is much greater per square foot than that of direct radiation, it is necessary to consider all pipes not properly insulated as so much radiation. For simplicity, it is usual to assume the pipes as equal to twenty-five per cent of the radiation.

COMPETITION.*

BY H. B. CRESWELL.

(*Continued from page 34.*)

FIRST of all, I would remind you that competitions do not in any way influence the number of buildings erected. Hence the whole mechanism of competitions effects nothing more than the selection of those particular architects who shall be appointed to execute certain buildings. Their whole justification rests, then, on the substantiation of the fact that the process of selecting architects by competition is better for the profession and for the national architecture, than if the architect were selected by his reputation or his proved fitness for the work. The question is *not,* gentlemen, whether competitions afford a short cut to notoriety for individuals, but whether, taken as a whole, that system of selection is the best system of selection. I am not going to urge the reasons which convince me that the competitive method of selection is a bad method, as a frequent usage, and bad in all cases except the limited competitions, but I will ask your permission to quote the mature opinion of Professor Kerr on this subject. He is reported to have spoken these words in 1871:

> The only conclusion I can arrive at with any regard for common sense is that the system of architectural competition is radically unsound in principle, and in practice most prejudicial to the profession of architects, both financially and morally. Whether it benefits the public in any way may be for a moment questioned, but even on this point I believe the answer must be eventually in the negative. . . . I have never known any man succeed in establishing by competition any reputation which he would not have better acquired without it, except occasionally a bad reputation, which, but for competition, he might fortunately have been able to escape. I know of no other temptation in business so subtle as that which assails, as I think, a high-minded man when involved in architectural competition, and especially if he is to be successful. I know of men who have succeeded by competing in attaining to the promise of a position which they were not qualified to hold, but they have never been able to retain it, and have in several cases been ruined in their legitimate prospects by the consequences of such hasty and fallacious good fortune. I do not hesitate to say that competition success leads generally to personal and public disrespect; and this not through jealousy alone or personal offense, but by reason of the ordinary estimate of the qualities by which alone such success can be obtained.

The remarkable emphasis of these words from a man of the experience and acquirements of Professor Kerr justify a dogmatic assertion, surely, that it is *doubtful* whether the apparent advantages of the competitive method of selection are not abrogated and overshadowed by the grave disadvantages attaching to it; and with that moderate statement before you, I will remind you at what costs and by what burdening of ourselves do we acquiesce in this system of competitions.

There are about thirty-six unlimited public competitions advertised yearly in England alone. The value of the average building is about £9,000, the number of competitors about forty and the value of the first premium about £56 (with further premiums aggregating to £52).

With regard to the much-debated question of the cost of producing the competition drawings, I will confine myself to the conclusion drawn in this matter by the special committee which sat to consider the subject of competitions in 1872. The report of this committee stated that the cost of producing competition drawings, irrespective of principal's time, varied from one-fourth to twenty per cent, or from £2 to £800; and we know that there are sometimes one hundred to two hundred sets of drawings, each set involving from four to twelve strainers.

Professor Kerr recalls cases of two hundred sets of competitive designs in competition in his day, and we, most of us, remember the Emanuel Church, Exeter, competition, where there were 405 applications for the conditions, although, owing, no doubt, to the publicity which was given to the growing dimensions of the competition, only some two hundred odd sets of designs were sent in, if my memory serves me rightly. I think I am right also in saying that the value of the building was only some £5,000, and that the cost of producing the drawings submitted in competition exceeded considerably the whole cost of the building.

From this it is apparent that in a competition for a building costing £9,000 the drawings would cost each competitor between £2 to £800 (my own personal estimate is £30, which seems a moderate one), so that we may consider that in a competition for a building costing £9,000 the cost of producing the drawings would be £1,200, which is nearly three times the sum which would be paid by the promoters by way of commission to the architect for designing and carrying out the works, and it not unfrequently happens that the cost of producing the drawings in competition for a building exceeds, as in the case of the Emanuel Church, Exeter, the whole cost of erecting the building itself.

I have found that the value of buildings advertised in the years 1894 and 1895 was £540,000, which is a sum of £270,000 in each year, and in 1858 Mr. George Morgan found that in the previous year, a year of depression in the building trade, public competitions were advertised for buildings estimated roughly to cost £300,000. I may also say that I have it on the best authority — the authority of a gentleman whose opinion you would hardly question in this matter — that at least half the architectural competitions are not advertised in the London papers, so that we may decide that the value of buildings advertised in competition in one year in England amounts to not less than *half a million.*

The cost of producing drawings in respect of these buildings, deduced from the figures I have already given you, is £65,000, estimating the average competition at £9,000, and it has been shown by Mr. Porter that the waste drawings prepared in competition during the twenty-five years previous to the year 1872, if laid edge to edge, would pave the way from the doorstep of this house we are now in to Grantham, and if laid flat one on top of the other would make a tower one thousand feet higher than the highest mountain in the world. I may add that I have tested the equation to satisfy myself that it is the drawings themselves that would afford this impressive spectacle, and we may not cajole ourselves into a belief in architectural competitions on the ground that this monument to our folly is composed of wooden strainers.

Gentlemen, it has been objected that the cost of producing these competition drawings should not be considered as lost to the profession, as the bulk of the money passes from the pockets of its senior to its junior members; but to say this is to revive the old economic sophistry which, on the ground that commercial prosperity relied on the circulation of money, used to advocate that it would benefit the country to break all its windows once a month — or, let us say, benefit the glaziers that they should break their own windows.

The difference between profitable and unprofitable labor need not be urged here, but it may be pointed out that if it is an advantage to the profession to produce nearly £65,000 worth of waste drawings in every year, it would still more greatly benefit the profession if such drawings, when completed, were sacrificed as an offering to our common weal, and new sets prepared for sacrifice in the moil of competition. The advantages of competitions as viewed by some of us would then be doubled.

I always feel that we do not fully realize the significance of these facts, and perhaps you will bear with me if I draw the comparison in the form of wasted labor instead of wasted money. If we estimate the proportion of the total of £65,000 spent yearly in waste drawings which is paid away to draftsmen at £58,500, which is nine-tenths of the total sum, and consider the average draftsman as paid at the rate of £2 per week, we find that there are in England alone at this moment nearly six hundred healthy persons closely employed solely in the production of drawings the destiny of which is not in any wise so useful as to line the footpath from here to Grantham; and it is our profession that provides and maintains these men for this distinguished purpose. Competitions account for six hundred supernumeraries in our profession — six hundred more architects and potential architects than can be distributed in the legitimate business of designing and erecting buildings.

With reference to some of these figures of mine and corroborative figures derived from Mr. Porter's historic paper on this subject at the congress of 1871, which I made use of in my previous paper, Mr. Aston Webb, who was then present and who spoke, seemed much depressed at the depreciation of competitions, implied thereby, and said, I quote from the report in the *Builder,* "that he remembered Mr. Porter very well and it should be remembered that that gentleman himself very often took part in competitions, and although, according to his statistics, competitions had such disastrous results, he was a competitor on a good many occasions. It was impossible to check the statistics either of Mr. Porter or of Mr. Creswell, and as had been said, there were such things as 'lies, big lies and statistics.'" Now, gentlemen, any one may check my figures who cares to give a certain, not inconsiderable, number of hours to the advertisement sheets and news paragraphs of the *Builder* during the years 1894 and 1895, and as to Mr. Webb's facile use of the word "lies," I believe Mr. Porter's reputation is as invulnerable to irresponsible aspersions of that sort as my own is untouched by them. However, I will say no more on that matter. Some people are not so sensitive or so circumspect in making implications of falsehood as others; in fact, I am aware of a class of people wherein one man will call another a liar with the idea of conveying friendly congratulations. But what I do strongly protest against is that we should be so blindly concentrated upon our own personal interests and so consumed in self-appreciation that we grudge to extend to the subject a consideration which may show that the convenient way for us individually is not the best way for us collectively.

I once heard a young man referring to competitions as "the young man's friend." What he wanted to say was, "I am a young man and have just won a competition."

It is exactly this personal, circumscribed, prejudiced attitude toward competitions which has kept us all these eighty years and more in hopeless quandary, and surely Mr. Porter was perfectly justified in competing while yet condemning the system under

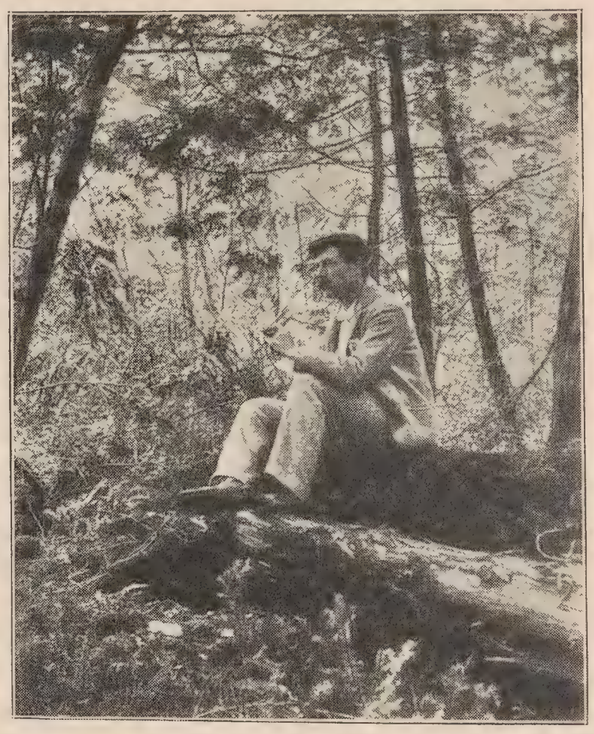
*Paper read before the Architectural Association at London, March 6, 1903, and published with full proceedings in *The Builder* for March 14.

which he competed, and his pronounced expressions of opinion and the evidence of his bias against competitions give special value to the propositions of his paper, and greater importance and weight to his wider depreciation of the whole principle of competitions by reason of his conviction being aloof from his personal proclivities. Personally, may I say that I have never entered for any competition for the reason, as I believe, that I am deficient in British sporting pluck, but I should not hesitate to do so if it seemed profitable or amusing, or I found myself in circumstances advantageous to success.

(To be continued.)

A GOOD WAY TO DESIGN.

AN architect said the other day that some of his best work had been done with a fishing-rod. He was a Chicago Architect and is celebrated for his artistic conception of the uses to which design can be made to lend itself to the purposes for which a building is constructed. But the fishing-rod idea was a new one, and further inquiry developed that when he had a specially interesting problem in design to solve he literally "took to the woods." With his rod, reel and landing-net, he sought one of the Wisconsin lakes (than which there are none more poetically encompassed by hill and wood) and spent days in pursuit of the elusive bass and studying out his problem. These Wisconsin and Minnesota lakes are endless in number and variety of location and surrounding scenery, and all contain the fish that the sportsman most desires. They are reached by one road, the Wisconsin Central, that seemingly was built, not as others, to connect the seats of great manufacturing enterprises and the large towns, but to give that communication with nature's richest preserves which the busy citizen requires when he needs rest from labor or wishes for uninterrupted thought amid quiet surroundings. This seems to be especially the mission of this road, for while its convenient trains of magnificently equipped Pullman sleepers, free reclining chairs and modern coaches roll daily from its station in Chicago outward to St. Paul, Minneapolis and the Pacific coast, or to the copper country, Ashland and Duluth, it also takes the traveler by the only direct route right into the heart of nature's most beautiful preserves, and in a few hours leaves him a happy and contented visitor to the resorts that line its course northward. There is no better way to work out a problem or rest the overtaxed mind than with a rod and line over the waters of a quiet lake or along a trout-infested stream, and the direct route is by this most conveniently timed and comfortable line of travel.



THE SILENCE OF THE FOREST.

Photo by R. C. McLean.

AT CHIPPEWA FALLS.

PAINTS IN ARCHITECTURE.

ZINC WHITE OR WHITE LEAD?

THE French Government reports on the question of substituting zinc white for white lead are very instructive. Following is a portion of one made by M. Moyaux for the General Council of Civil Structures:

"Besides the quality of remaining white, zinc white has another, very important, that of being innocuous. . . . . Zinc white is as durable, at least in interiors, and more beautiful than white lead, which yellows rapidly. Its use is quite as easy as that of white lead; it is merely a matter of habit to be acquired by the painter, and when he has acquired it, he will no longer wish to use white lead, knowing what it costs him.

"In order, moreover, to make zinc white cover as well as white lead, it is only necessary to keep the paint a little thicker by using in its composition, as with putty, a larger proportion of oil and less turpentine.

Painting done with zinc dries, it is true, less quickly than that done with lead, but this inconvenience may be obviated, if one is hurried, by thinning the pigment with manganese oil or by adding special dryers, such as borate of manganese or the zumatic dryers, which are obtainable from all manufacturers of zinc white.

"Has it been demonstrated that painting done with zinc resists the elements less well than painting done with lead? Some say yes, others no. There does not yet seem to be sufficient accord on this point; nevertheless, the presumption would be rather against zinc used for exterior painting. What we know positively is that certain contracting painters have entirely abandoned the use of white lead in their work, and that both they and their workmen could not be better satisfied with the results.

"On interiors the results are incomparably better, because the work, as we have already remarked, remains fresh, while painting done with white lead turns yellow in a very short time.

* * * * * * * * * *

"To sum up, everything argues rather in favor of zinc white, and this is so much the case that the manufacturers of white lead have reduced the price of their product. But if we owed to zinc white nothing but the means of avoiding the poisoning of painters and their children, we should feel obliged to prohibit the use of white lead in painting, even if the former cost a little more; this at least is the opinion of your reporter."—*Translated by Charles Jourdain.*

CORRESPONDENCE.

Editor INLAND ARCHITECT: URBANA, ILL., May 7, 1903.

DEAR SIR,—A letter published in THE INLAND ARCHITECT for April, 1903, expresses the objections of the writer to the following rule of the Board of Examiners of Architects:

"From and after June 1, 1902, the diploma of graduation from the full four years' course in architecture or architectural engineering, in any recognized school of architecture, may, at the discretion of the Board be accepted as satisfactory evidence of a competent knowledge of architectural construction, of the laws of sanitation, and of the strength of materials, required for license to practice as an architect in Illinois according to law; provided, that in each case the applicant for examination shall present evidence satisfactory to this Board to show that he has acquired the ability to successfully apply this knowledge to the design and construction of buildings and to supervise the execution of work."

Since graduates in architecture from the Massachusetts Institute of Technology, and from Harvard, Columbia, Pennsylvania, Cornell, and Illinois Universities are now admitted to the American Institute of Architects without taking the severe examinations prescribed for all other candidates for membership, some concessions in the examinations for license are certainly due to those graduates on account of their four years of faithful professional study.

It is certainly reasonable to assume that in any one of these American schools of architecture, instruction in architectural construction, laws of sanitation and strength of materials exceeds the minimum knowledge required by the license law. Also that it would be better for the public were all future architects thoroughly prepared in such schools, than if, as at present the case, this indispensable knowledge usually be slowly acquired by experience and by private study, rarely under competent direction.

Therefore, the Board adopted this rule, which merely credits such graduates with this information, exempting them from examinations only during two of the five half days devoted thereto.

The Board of Examiners is always ready to examine evidence of careless or reckless construction, or of incompetent professional

knowledge by licensed architects, whenever presented for its consideration. In such a case, if the charges are sustained by sufficient evidence, the Board of Examiners has full authority to revoke the license, even though the architect may have passed an examination.

Very truly yours,

N. CLIFFORD RICKER,
President Board of Examiners of Architects.

RECREATION AS A BUSINESS.

THERE is an old sailor "catechism" that one hears even now chanted by some ancient, weather-beaten sailor, as he stands his watch forward, when the white foam dashes from the bows and the night wind blows chill and strong beneath the glistening stars:

"Six days shalt thou labor, and do all that thou art able;
On the seventh thou shalt holystone the decks, and rub down the cable."

But while to the sailor it is all in the day's work and Sundays included, to the actively engaged landsman there is no recreation equal to that found upon an elegantly appointed, stanch and spacious passenger steamer that bears one away from the dust, heat and racking brain problems of the city, out across the free, broad waters of one of our inland seas toward pine forests and cool lakes and streams of the northland. Those who have sought this summer diversion need not be told that in its variety of pleasures and benefits it is beyond all others the most satisfying, but to those that have not, their experience should be of value. Of all the steamship routes that may be taken from Chicago, the favorite boats are the Illinois and the City of Charlevoix, of the Northern Michigan line. The line is the oldest in experience in catering to this class of travel and the boats the newest, best equipped, safest and speediest that sail from that port. They are floating hotels upon the "American plan," where the passage ticket includes every necessity, comfort and convenience, under the care of the veteran officers of the great lakes, and to those, who, like the sailor, worked "nights and Sundays" for eleven months, it is an earthly paradise to find the land receding and the smoke and grime of the hot, noisy city disappearing with the smoke from the steamer's funnels, and the prospect of a fortnight or a month of entire rest rising from the haze that floats above the water far in the direction toward which the boat is speeding.

The spacious deck and the wide expanse of water on every hand has in itself a restfulness that can be found nowhere else, and the day sinking into the star-lit or moon-illumined night dispels the nervous tension that has lasted so long.

The steamer touches at many ports, any one of which contains much of interest to the traveler. In the early morning the first touched by the Northern Michigan line boats is Ludington, 160 miles northeast from Chicago, on the east shore of the lake. It is a beautiful city, with an inland harbor, the tonnage of which is only second to that of Chicago on Lake Michigan. It is the home, during the summer, of hundreds of strangers from Chicago and other western cities. This is also true of Manistee, the next point of call, and then Frankfort, the beautiful South and North Manitou islands, and across on the mainland in the shelter of Sleeping Bear Point, lie the little summer homes of those who resort to Glen Haven and Glen Arbor for a summer holiday. Rounding a bold point the broad expanse of the Great Traverse Bay is seen, and along its shores is passed in turn Northport, Suttons Bay, Old Mission and Elk Rapids, all quaint, old towns, each with its history of early frontier days, until Traverse City is reached, with its surroundings of wooded hills, clear lakes and pleasure drives. Then

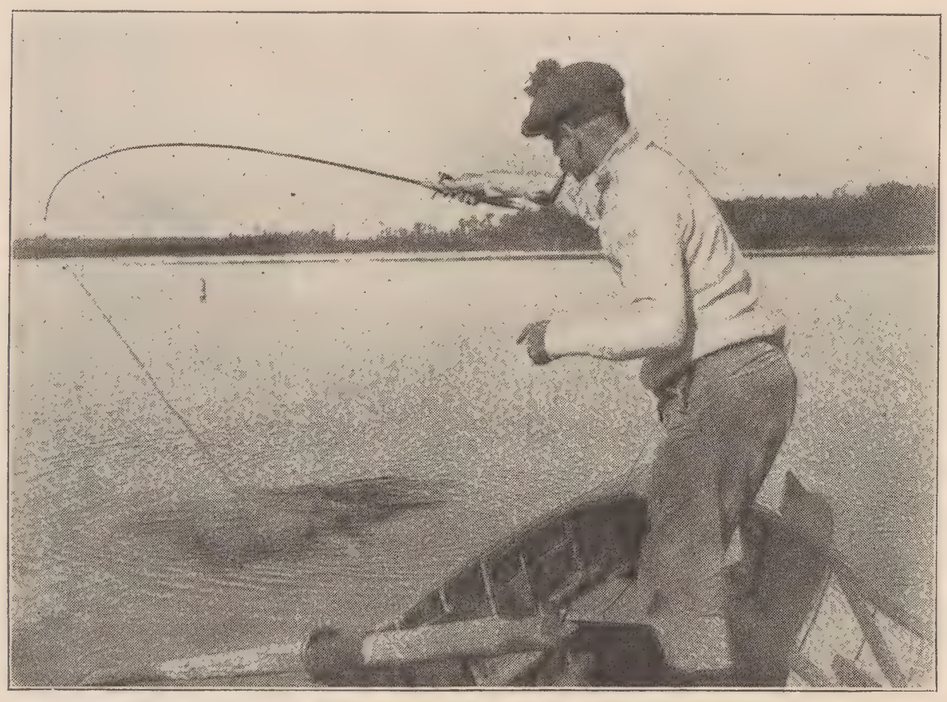


Photo by R. C. McLean.
AN ANXIOUS MOMENT.

"In the afternoon they came into a land,
That seemed as if 'twere always afternoon."

for, passing up a narrow channel between high pine-covered hills, an inland harbor broadens out and Charlevoix, the queen of northern Michigan resorts, spreads its fair beauty of harmoniously constructed cottages and hotels, mingled with the greenness of the pines. Here every possible recreation is found in its most advanced form and under the most favorable conditions, from yachting to tennis and golf, and the cool lake-tempered breezes make every moment enjoyable.

Those who seek intellectual recreation find it at Petoskey and the colonies that at Roaring Brook, Wequetonsing, Harbor Springs and Harbor Point circle the Little Traverse Bay; and those who revel in old legends of Pere Marquette and the early pioneers find rich lore here. This is also true of St. Ignace, and here is the supposed resting place of that enterprising priest. St. Ignace is now the summer home of the Western Hay Fever Association, which, under the able leadership of Mr. T. A. Cosgrove, of Chicago, and the coöperation of the citizens, has

Photo by R. C. McLean.
MOONLIGHT AT HARBOR POINT.

built a pavilion and laid out permanent grounds for cottages, and in a locality where hay fever can not exist, has given to such sufferers a summer home that is fast becoming the Mecca for all who are troubled with that most health-destroying malady.

Of course every one knows that splendid rock that rises from the center of the straits and spreads its fair length for three miles from east to west, Mackinac Island, with its old fort of British and American memories and its splendid summer homes and great hotel on the tree-crowned summit of the bold island front. It is a fitting terminus for the passenger line of steamers that take thousands away over the lake, from hot, stifling, nerve-destroying cities, into the cool, calm restfulness that lies such a short distance beyond.

"AMERICAN" STEAM BOILERS. "ADVANCE" WATER HEATERS.*

BY MORRIS R. EBERSOLE.

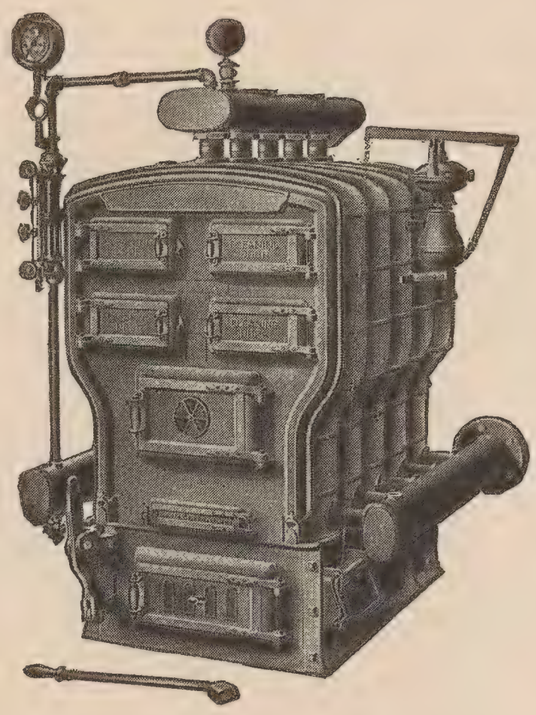
THE guiding principles in the construction of these boilers, as in the construction of all heating goods manufactured by this company, are, absolute excellence in the material of construction, the highest grade of workmanship, and the thorough manner in which the details of grate area, heating surface and fire travel have been treated. We have placed in the American boilers the largest possible amount of direct self-cleaning fire surface over and around the fire chamber in close proximity to the burning fuel.

The consumer purchases a heating apparatus perhaps only once in a lifetime, but he has to provide fuel, attention and maintenance annually. It is therefore prudent in the selection of a heating apparatus that he should investigate carefully the boiler or heater, which is really the mainspring of the entire plant. It should possess meritorious features which render it at once economical in the use of fuel, and coexistent with desired results, to require minimum attention, and thirdly, durability, so that frequent outlay for repairs should be as far as possible eliminated. Designed by experts and manufactured by experienced mechanics, we have incorporated such ideas in these boilers.

In the construction of these boilers we have introduced features entirely new to this type in what is called the "Drop Tube" principle. These vertical or drop tubes are drained at the bottom so that no sediment can accumulate and interfere with the circulating water, the cooler portions of which flow down the water leg, are rapidly heated, and then ascend *ad infinitum*. This affords an immense amount of self-cleaning fire surface well applied to the fire, by virtue of which it is possible to generate steam quickly, hold it longer, and evaporate more water for every pound of coal consumed than has ever been accomplished in any former construction of steam-heating boilers; and in hot-water heaters, to heat large quantities of water and maintain it in continuous and positive circulation, absorbing heat to such an exent that the products of combustion reach the chimney at a very low temperature. The large fire surface possible and provided for in

* From *The Boiler Magazine*, Kellogg-Mackay-Cameron Company, Chicago.

these boilers is an all-important point, for by increasing it, more direct rays radiate and penetrate the overhanging surfaces, and the efficiency is enormously increased; that is, the heat from a given quantity of fuel is more completely absorbed. The moment the burning gases rise from the beds of coals they are in a high state of chemical activity; in other words, they are in the most active state of combustion, they expand, and at this point reach their highest degree of heat. In the American boilers we have provided a fire chamber of just sufficient size to accommodate this necessary expansion of burning gases. Thin sections with spaces between project downward into this zone of highest heat, and all these surfaces being backed up by water, the heat is greedily and rapidly absorbed. From the fire chamber the gases and heated products of combustion pass through openings in the sections, making one or more trips from the front to the back of the boiler before they pass up the chimney. Excessive flue surface is undesirable and inefficient in a boiler intended primarily for heating purposes, and we find that in tubular and other ordinary heating boilers, from seventy to eighty per cent of the entire heating surface is flue surface, and only twenty to thirty per cent actual fire surface, while in the American and Advance, seventy per cent of the heating surface is self-cleaning, direct fire surface, and only thirty per cent is flue surface, by actual measurement.



It is conceded that one foot of fire surface is equal to three of flue surface, therefore the advantages of this type of construction will be fully appreciated.

WILCE END-MATCHED FLOORING PATENT.

ON another page of this issue is an important notice by the owners of the Wilce End-matched Flooring Patent. End-matched flooring has gone into such universal use all over the United States that the litigation of the Wilce patent, now pending in the United States Circuit Court for the Northern District of Illinois, is of great interest to all those who are at all interested in building construction.

On April 15, 1903, the Court, Judge Seaman presiding, filed a very forceful decision, upholding the validity of the patent and finding that the same has been infringed in the floors which were laid in the Bush Temple of Music building in this city.

This decision, with the general notice the complainants gave to the public, caused those interested in attempting to defeat the patent to scour the country to find something upon which to build their hopes. The outcome is apparently not very assuring to infringers.

On Tuesday, June 2, the defense petitioned the Court to reopen the case in order to give them an opportunity to introduce evidence showing that *butt-ended* flooring had, in a few buildings and to a very limited extent, been laid "hit and miss" on supporting strips, prior to the Wilce patent — that is to say, the end joints did not all come on the strips. They presented several *ex parte* affidavits in support of the petition. The defense frankly admitted to the Court that such use will not operate as an anticipation of the Wilce patent, but will only serve to show the prior art. That is to say, *if true,* such use does not disclose the Wilce invention, but only shows an attempt to secure some of the advantages the public quickly appreciated when the Wilce invention was made known.

The Wilce attorneys not only consented but also requested the Court to reopen the case to admit the alleged evidence.

The Court order reopening the case is as follows:

CIRCUIT COURT OF THE UNITED STATES, NORTHERN DISTRICT OF ILLINOIS.

NORTHERN DIVISION.

EDMUND HARVEY WILCE, *et al.*

vs.

BUSH TEMPLE OF MUSIC COMPANY, *et al.*

In equity, No. 26,175.

This cause coming on to be heard on this second day of June, 1903, upon the defendants' petition for rehearing by reason of newly discovered evidence, set forth in the affidavits filed in support of said petition; and counsel for plaintiffs consenting thereto and requesting that the decree heretofore entered be set aside and the alleged newly discovered evidence be admitted, and suggesting that thirty days be allowed to the plaintiffs for investigating the alleged new evidence before the proofs shall be taken; it is hereby

Ordered, adjudged and decreed that the decree hereinbefore entered be set aside, and that the evidence be reopened for the purpose of admitting proofs on the line of, and in accordance with, the allegations contained in said petition.

It is further ordered that the plaintiffs have thirty days from this date for investigation before said proofs shall be taken; and that at the expiration of said thirty days, unless the parties shall submit an agreed statement of facts, the defendants shall have sixty days in which to put in their evidence, and the plaintiffs shall have sixty days for rebuttal.

From the readiness of the Wilce Company's counsel to admit the new evidence claimed to have been found by the defense, it is apparent that they have no fear of its effect on their case, but realizing the importance of an early decision both to the public at large, as well as the parties to the suit, they desired to expedite the case as much possible.

We are informed that they first proposed to request the Court to admit the *ex parte* affidavits as evidence without rebuttal and to set the case for an early hearing. The great unreliability of such *ex parte* affidavits, unless tested by cross-examination or rebuttal testimony, decided them to first investigate.

The Court fixed the time for taking the new evidence at sixty days for each party.

This action simply stays the accounting and injunction for a short time, and does not indicate any change whatever in the opinion of the Court.

The fact that those interested in defeating the patent have with all their efforts been unable to find any previous instance of an end-matched floor like that of the Wilce patent, will naturally cause intelligent business men to keep clear of infringing the patent while the litigation is pending. In the meantime the owners of the patent have arranged that the material may be readily obtained through their licensees and thus all danger of future damages be avoided.

We are informed that the agents of the Wilce Company are visiting buildings all over the country and quietly listing those infringing the patent, for future consideration.

OUR ILLUSTRATIONS.

Church, Philadelphia.

Bachelor Apartments, New York city; Lienau & Nash, architects.

Lloyd Hall, Haverford, Pennsylvania; Cope & Stewardson, architects.

Interior view, Southern Pacific railway station, San Francisco, California.

Addition to store building of Mandel Brothers, Chicago; Holabird & Roche, architects.

Catholic College, Brighton, Massachusetts; Maginnis, Walsh & Sullivan, architects, Boston.

Hackley Hospital, Muskegon, Michigan; Fuller & Pitcher, architects, Albany, New York.

Store building for Schlesinger & Mayer, Chicago; Louis H. Sullivan, architect; general view and detail of wrought-iron work are shown.

Views, summer residence of John Dupee, Oconomowoc, Wisconsin; Frederick W. Perkins, architect. The following views are shown: View in hall; view in dining-room; view of stable.

Photogravure Plate: Trenton Saving Fund Society building, Trenton, New Jersey; Mowbray & Ufflinger, architects, New York.

PHOTOGRAVURE PLATES.

Issued only with the Photogravure Edition.

Fire Station, Germantown, Pennsylvania; Philip H. Johnson, architect.

Apartment building, Brookline, Massachusetts; E. A. Tucker, architect, Boston.

Episcopal Church, Lansdowne, Pennsylvania; Frederick Mann, architect, Philadelphia.

Residence of William Gest, Merion, Pennsylvania; W. L. Price, architect, Philadelphia.

Residence of J. M. Gest, Overbrook, Pennsylvania; W. L. Price, architect, Philadelphia.

Rear view, residence of Mr. Paul, Wayne, Pennsylvania; Horace Trumbauer, Philadelphia.

Residence of C. J. Clark, Bryn Mawr, Pennsylvania; Newman, Woodman & Harris, architects. Philadelphia.

Corrections: The Grant residence, Denver, Colorado, published in April number, was designed by Boal & Harnois, architects.

The "School Building," published in the Photogravure edition for April. is the Dorchester, Massachusetts, High School; Hartwell, Richardson & Driver, architects, Boston.

The "Residence, Chicago," in the Photogravure plates for May, was designed by Leon Stern, architect, Rochester, New York; not by Frost & Granger.

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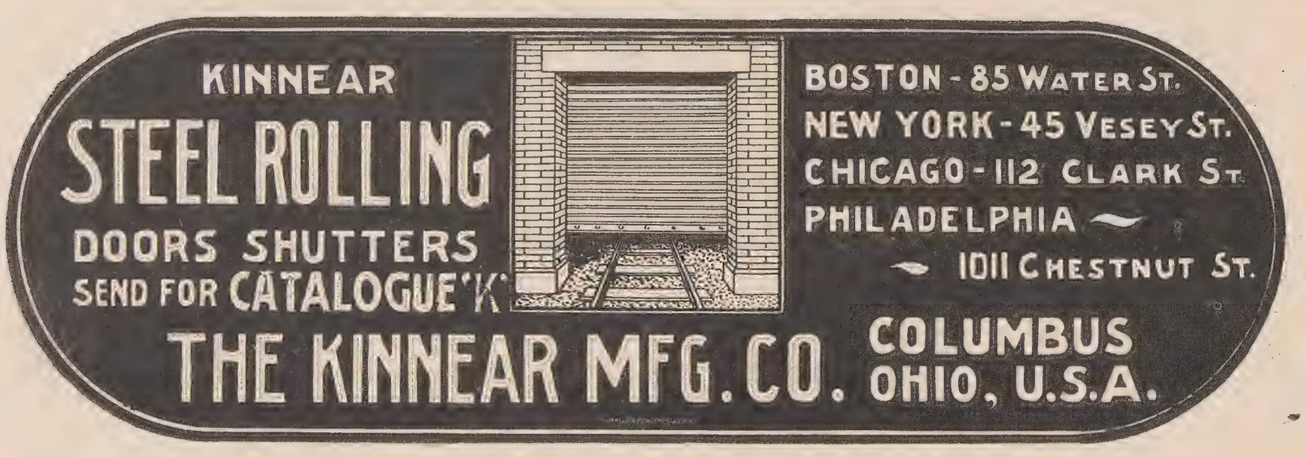

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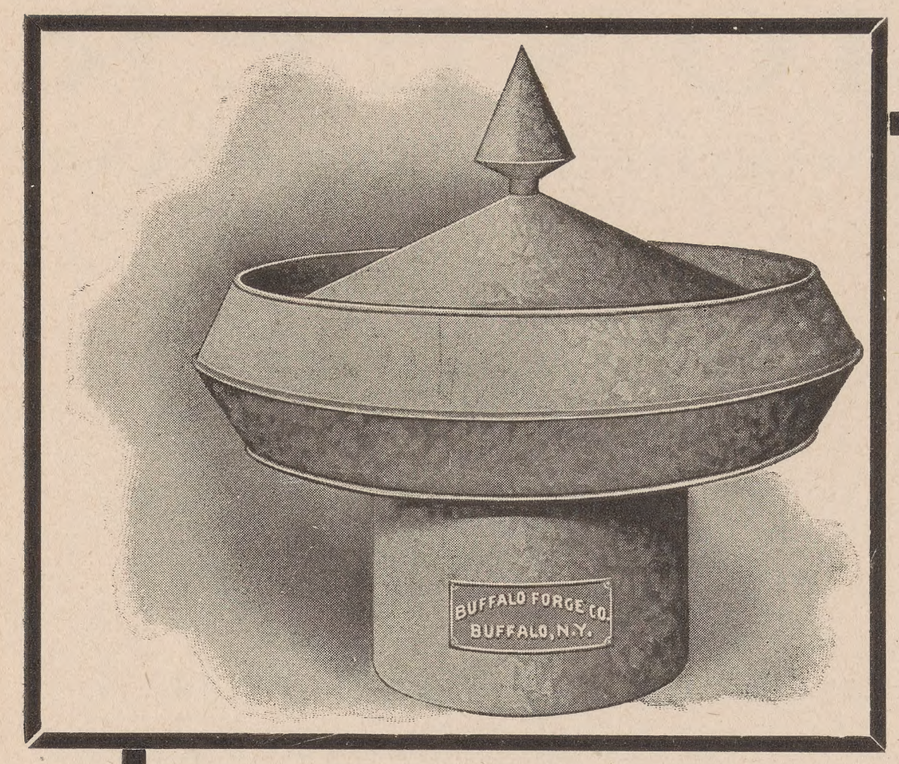

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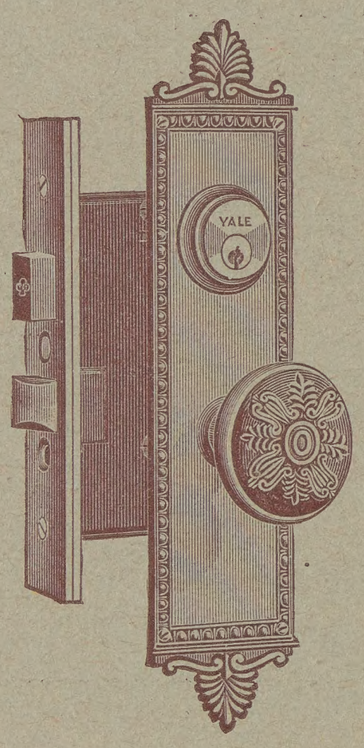

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